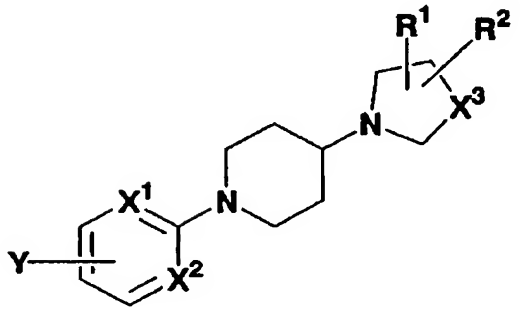
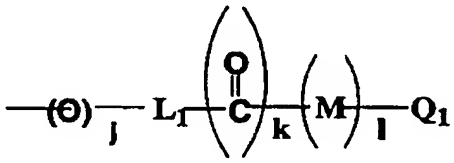
CLAIMS

1. A compound of a general formula (I):



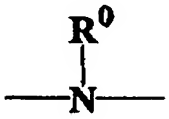
(I)

[in formula (I), X^1 and X^2 independently represent a nitrogen atom or CH; X^3 represents O_s-$(CH_2)_m$ (in which s indicates 0 or 1; m indicates an integer to make (m + s) 0 or 1 to 4); Y represents a group of a general formula (II):



(II)

(in formula (II), j, k and l independently indicate 0 or 1; L_1 represents a C1 to c4 lower alkylene group or a single bond; M represents an oxygen atom or a group of a general formula (III):



(III)

(in formula (III), R^0 represents a hydrogen atom or a C1 to C4 lower alkyl group); Q_1 represents a linear or branched lower alkyl group, an optionally-condensed C3 to C9 cycloalkyl group, a phenyl group, a naphthyl group, or an optionally-condensed 3- to 8-membered heterocyclic group (the hetero ring may have from 1 to 3 hetero atoms selected from a group consisting of an oxygen atom, a sulfur atom and a nitrogen atom), which is unsubstituted or has a substituent selected from a group consisting of a cyano group, a hydroxyl group, a lower alkyl group (the lower alkyl group may be further substituted with a hydroxyl group, a halogen atom, an amino group, an aryl group or a heteroaryl group), a cycloalkyl group, a lower alkoxy group (the lower alkoxy group may be further substituted with a halogen atom), a halogen atom, a mono-lower alkylcarbamoyl group, a di-lower alkylcarbamoyl group, a carbamoyl group, a cycloalkyliminocarbamoyl group, a lactam ring, a trifluoromethyl group, a mono-lower alkylamino group, a di-lower alkylamino group and an alkanoyl group) (but excepting the following:

1) a case where Y is an alkoxycarbonyl group, or

2) a case where Y of formula (II) is a group of the following formula (II-1):

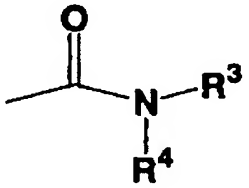
$-L_1-O-Q_1$ (II-1)

(in formula (II-1), L_1 and Q_1 have the same meaning as L_1 and Q_1 in formula (II));

R^1 and R^2 independently represent a hydrogen atom, a halogen atom, a linear or branched lower alkyl group, a lower alkoxy group, or an acetyl group substituted with 2 or 3 fluorine atoms] (but excepting 1-[4-(piperidin-1-yl)piperidin-1-yl]-4-(7-carbamoyl-1H-benzimidazol-2-yl)benzene, 1-{4-(piperidin-1-yl)piperidin-1-yl}-4-(5-cyano-6-oxo-pyridin-2-yl)benzene and 1-{4-(pyrrolidin-1-yl)piperidin-1-yl}-4-(5-cyano-6-oxo-pyridin-2-yl)benzene) or its pharmaceutically-acceptable salt.

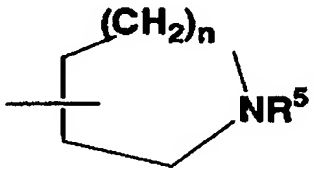
2. The compound or its pharmaceutically-acceptable salt as claimed in claim 1, wherein, in formula (I), R^1 and R^2 are hydrogen atoms, m in X^3 is an integer of from 1 to 3, and s is 0.

3. The compound or its pharmaceutically-acceptable salt as claimed n claim 1 or 2, wherein, in formula (II), Y is a group of a general formula (IV):



(IV)

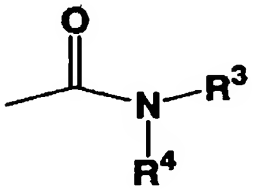
in formula (IV), R^3 is a hydrogen atom, or a lower alkyl group, and R^4 is a group of a general formula (V):



(V)

[in formula (V), R^5 represents a hydrogen atom, a lower alkyl group, a C3 to C8 cycloalkyl group, an aralkyl group, or a heteroaryl group; n indicates 0 or an integer of from 1 to 4].

4. The compound or its pharmaceutically-acceptable salt as claimed in claim 1 or 2, wherein, in formula (II), Y is a group of a general formula (IV):



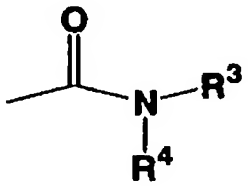
(IV)

in formula (IV), R^3 is a hydrogen atom, or a lower alkyl group, and R^4 is a group of a general formula (VI):

$$-(CH_2)_q-A \qquad (VI)$$

[in formula (VI), A represents an aryl group, a heteroaryl group, a condensed bicyclic group of a C4 to C7 cycloalkyl group and an aryl group, or a condensed bicyclic group of a C4 to C7 cycloalkyl group and a heteroaryl group; q indicates 0 or an integer of from 1 to 3].

5. The compound or its pharmaceutically-acceptable salt as claimed in claim 1 or 2, wherein, in formula (II), Y is a group of a general formula (IV):



(IV)

in formula (IV), R^3 and R^4 form a nitrogen-containing heterocyclic group as integrated with the nitrogen atom to which they bond.

6. The compound or its pharmaceutically-acceptable salt as claimed in claim 5, wherein the nitrogen-containing heterocyclic group is a monocyclic group such as a piperidinyl group, a pyrrolidinyl group, an azetidinyl group, a homopiperidinyl group or a heptamethyleneiminyl group, or a bicyclic group of such a monocyclic group and a C4 to C7 cycloalkyl group, a phenyl group or a pyridyl group.

7. The compound or its pharmaceutically-acceptable salt as claimed in any of claims 3 to 6, wherein X^1 and X^2 are both CH_2, or one of them is a nitrogen atom.

8. The compound or its pharmaceutically-acceptable salt as claimed in claim 1 or 2, wherein, in formula (II), Y is an aryl group or a 5-membered or 6-membered heteroaryl group (the heteroaryl group has, in the ring thereof, from 1 to 3 hetero atoms selected from a group consisting of a nitrogen atom, a sulfur atom and an oxygen atom), which is unsubstituted or substituted with 1 or 2 substituents selected from a group consisting of a lower alkyl group, a lower alkoxy group, a hydroxyl group and a halogen atom.

9. The compound or its pharmaceutically-acceptable salt as claimed in claim 8, wherein X^1 and X^2 are both nitrogen atoms.

10. The compound or its pharmaceutically-acceptable salt as claimed in claim 1, wherein the piperidine derivative compound of formula (I) is any of the following:

N-methyl-N-(1-methylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (1),

N-(1-methylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (2),

N-methyl-N-(1-cyclobutylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (3),

N-methyl-N-(1-cyclopentylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (4),

N-methyl-N-(1-cyclohexylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (5),

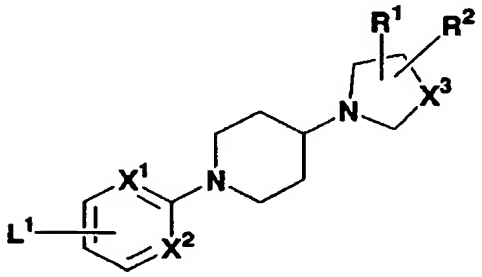
N-methyl-N-(1-cyclohexylmethylpiperidin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (6),
N-methyl-N-[(3R)-1-cyclopentylpyrrolidin-3-yl]-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (7),
N-methyl-N-[(3S)-1-cyclopentylpyrrolidin-3-yl)]-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (8),
N-methyl-N-[(3R)-1-benzylpyrrolidin-3-yl)]-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (9),
N-methyl-N-[(3R)-1-benzylpyrrolidin-3-yl)]-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (10),
N-(pyridin-4-yl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide trifluoroacetate (11),
2-{4-(piperidin-1-yl)piperidin-1-yl]benzoyl-1,2,3,4-tetrahydroisoquinoline (12),
1-{4-(piperidin-1-yl)piperidin-1-yl]benzoyl-1,2,3,4-tetrahydroquinoline (13),
1-{4-(piperidin-1-yl)piperidin-1-yl]benzoyl-4-phenylpiperazine (14),
N-methyl-N-[1-(pyrimidin-2-yl)piperidin-4-yl]-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (15),
N-methyl-N-(thiophen-2-yl)methyl-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (16),
N-methyl-N-phenethyl-4-[4-(piperidin-1-yl)piperidin-1-yl]benzamide (17),
1-{4-(piperidin-1-yl)piperidin-1-yl]benzoyl-3-(3,4-difluorophenyl)pyrrolidine (18),
4-{4-(piperidin-1-yl)piperidin-1-yl]benzoylpiperidin-1-yl (19),
N-methyl-N-(1-methylpiperidin-4-yl)-4-[4-(pyrrolidin-1-yl)piperidin-1-yl]benzamide (20),
N-methyl-N-(1-methylpiperidin-4-yl)-4-[4-(azetidin-1-yl)piperidin-1-yl]benzamide (21),
N-methyl-N-(1-methylpiperidin-4-yl)-5-[4-(piperidin-1-yl)piperidin-1-yl]pyridine-2-carboxamide (22),
N-methyl-N-(1-methylpiperidin-4-yl)-4-[4-(4,4-difluoropiperidin-1-yl)piperidin-1-yl]benzamide (23),
2-[(4-piperidin-1-yl)piperidin-1-yl]-5-(4-cyanophenyl)pyrimidine (24),
2-[(4-piperidin-1-yl)piperidin-1-yl]-5-(3-pyridyl)pyrimidine (25),
2-[4-(piperidin-1-yl)piperidin-1-yl]-5-(3-trifluoromethylphenyl)pyrimidine (26),
2-[4-(piperidin-1-yl)piperidin-1-yl]-5-(3,5-dichlorophenyl)pyrimidine (27),
2-[4-(piperidin-1-yl)piperidin-1-yl]-5-(2-naphthyl)pyrimidine (28),
2-[4-(piperidin-1-yl)piperidin-1-yl]-5-[4-(pyrrolidin-1-ylcarbonyl)phenyl]pyrimidine (29),
1-[4-(piperidin-1-yl)piperidin-1-yl]-4-(3-pyridyl)benzene (30),
1-(piperidin-1-ylmethyl)-4-[4-(piperidin-1-yl)piperidin-1-yl]benzene (31).

11. A histamine-H3 antagonist or inverse-agonist containing, as the active ingredient thereof, a compound or its pharmaceutically-acceptable salt of any of claims 1 to 10.

12. A preventive or remedy containing, as the active ingredient thereof, a compound or its pharmaceutically-acceptable salt of any of claims 1 to 10, which is for metabolic system diseases such as obesity, diabetes, hormone secretion disorder, hyperlipemia, gout, fatty liver; circulatory system diseases, for example, stenocardia, acute/congestive cardiac insufficiency, cardiac infarction, coronary arteriosclerosis, hypertension, nephropathy, sleep disorder and various diseases accompanied by sleep disorder such as idiopathic hypersomnnia, repetitive hypersomnnia, true hypersomnnia, narcolepsy, sleep periodic acromotion disorder, sleep apnea syndrome,

circadian rhythm disorder, chronic fatigue syndrome, REM sleep disorder, senile insomnia, night worker sleep insanitation, idiopathic insomnia, repetitive insomnia, true insomnia, electrolyte metabolism disorder; and central and peripheral nervous system diseases such as bulimia, emotional disorder, melancholia, anxiety, epilepsy, delirium, dementia, shinzophrenia, attention deficit/hyperactivity disorder, memory disorder, Alzheimer's disease, Parkinson's disease, sleep disorder, recognition disorder, motion disorder, paresthesia, dysosmia, epilepsy, morphine resistance, narcotic dependency, alcoholic dependency.

13. A method for producing a compound of a general formula (I-1), which comprises reacting a compound of a general formula (Ia):

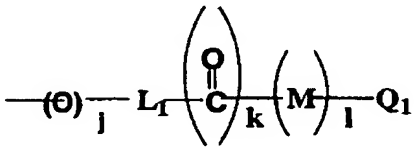


(Ia)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (I); and L^1 represents a leaving group] and a compound of a general formula (IIa):

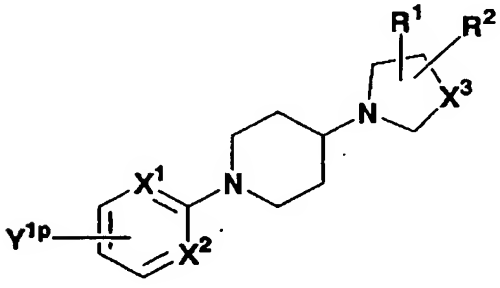
$$Met\text{-}Y^{1p} \qquad (IIa)$$

[wherein Met represents a metal atom-containing atomic group; and Y^{1p} has the same meaning as Y in a general formula (II):



(II)

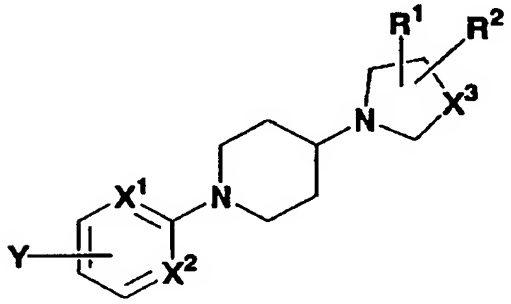
or represents a group corresponding to it but protected at the amino group, the hydroxyl group or the carboxyl group therein], in the presence of a catalyst to give a compound of a general formula (Ib):



(Ib)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (Ia); and Y^{1p} has the same

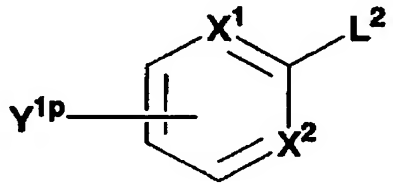
meaning as Y^{1p} in formula (IIa)], and optionally removing or converting the protective group for the functional group of Y^{1p} to thereby produce a compound of a general formula (I-1):



(I-1)

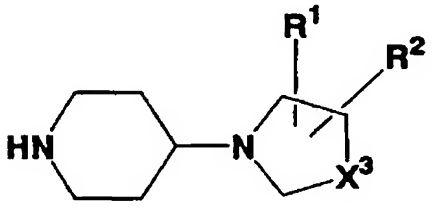
[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (Ib); and Y is a group derived from Y^{1p} in formula (Ib) by removing or converting the protective group for the functional group of Y^{1p}].

14. A method for producing a compound of a general formula (I-2), which comprises reacting a compound of a general formula (Ic):



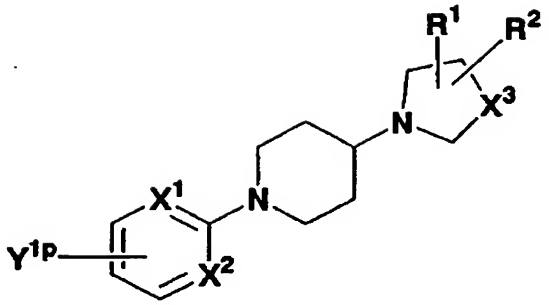
(Ic)

[wherein X^1 and X^2 have the same meanings as X^1 and X^2 in formula (I); Y^{1p} has the same meaning as Y in formula (II), or represents a group corresponding to it but protected at the amino group, the hydroxyl group or the carboxyl group therein; and L^2 represents a leaving group] and a compound of a formula (Id):



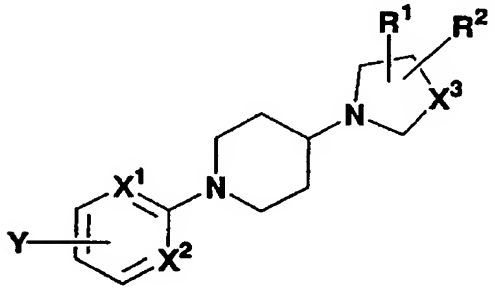
(Id)

[wherein R^1, R^2 and X^3 have the same meanings as R^1, R^2 and X^3 in formula (I)] under a basic condition or in the presence of a catalyst to give a compound of a general formula (Ie):



(Ie)

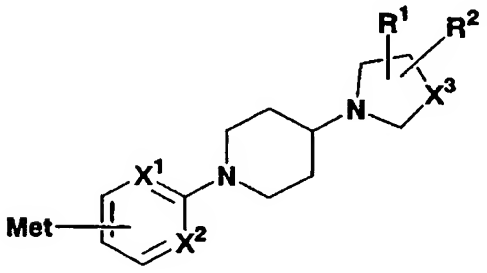
[wherein X^1, X^2 and Y^{1p} have the same meanings as X^1, X^2 and Y^{1p} in formula (Ic); X^3, R^1 and R^2 have the same meanings as X^3, R^1 and R^2 in formula (Id)], and optionally removing or converting the protective group for the functional group of Y^{1p} to thereby produce a compound of a general formula (I-2):



(I−2)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (Ie); and Y is a group derived from Y^{1p} in formula (Ie) by removing or converting the protective group for the functional group of Y^{1p}].

15. A method for producing a compound of a general formula (I-3), which comprises reacting a compound of a general formula (If):

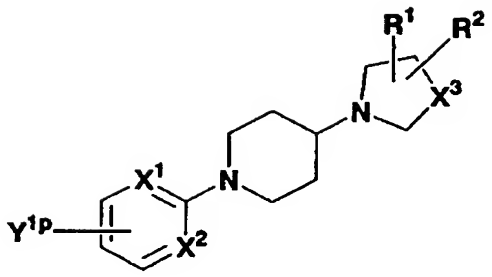


(If)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (I); Met represents a metal atom-containing atomic group] and a compound of a general formula (IIb):

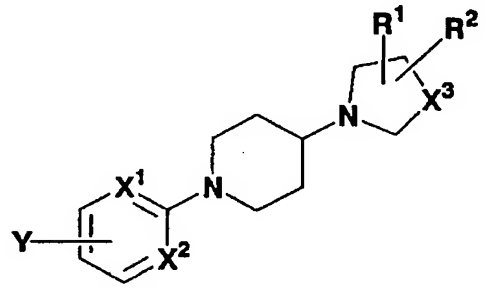
$$Y^{1p}\text{-}L^2 \qquad \text{(IIb)}$$

[wherein Y^{1p} has the same meaning as Y in a general formula (II), or represents a group corresponding to it but protected at the amino group, the hydroxyl group or the carboxyl group therein; and L^2 represents an ordinary leaving group] to give a compound of a general formula (Ig):



(Ig)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (If); and Y^{1p} has the same meaning as Y^{1p} in formula (IIb)], and optionally removing or converting the protective group for the functional group of Y^{1p} to thereby produce a compound of a general formula (I-3):



(I-3)

[wherein X^1, X^2, X^3, R^1 and R^2 have the same meanings as X^1, X^2, X^3, R^1 and R^2 in formula (Ig); and Y is a group derived from Y^{1p} in formula (Ig) by removing or converting the protective group for the functional group of Y^{1p}].